Using Statistical, Technological, and Participatory Methods to Identify Environmental and Health Disparities in California

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Background and Aims: Low-income and communities of color often bear the disproportionate burden of environmental hazards and poor health outcomes. The mission of the California Environmental Health Tracking Program (CEHTP) is to provide data and develop tools to identify environmental and health inequities, examine trends over space and time, and generate hypotheses about relationships between environmental hazards and health outcomes.
Methods: To accomplish the mission, CEHTP utilizes advanced statistical, technological, and participatory methods. Hierarchical Bayesian methods are employed to calculate rate estimates where data are sparse. Hazard and health data are displayed in dynamic web maps, allowing users to pan and zoom across the state. Participatory processes are used to engage stakeholders to provide input on tools development, validate data, and disseminate data. Stakeholders include community groups, governmental and non-governmental organizations, planners, and researchers.
Results: Using these innovative methods, CEHTP identifies and examines critical environmental hazards and health disparities that exist in California. For example, pesticide exposure and pre-term birth are of concern to many communities throughout California, especially low-income communities and communities of color. The CEHTP Pesticide Web Mapping Tool displays agricultural pesticide use at the community level for the entire state. A non-governmental partner organization has used the tool to identify and outreach to communities most vulnerable to pesticide exposure. CEHTP also created a web mapping tool that displays modeled pre-term birth data. This has enabled community-based partners to see spatial patterns of pre-term birth that vary significantly by census tract and follow patterns of poverty.
Conclusions: CEHTP's efforts have contributed to the identification and characterization of environmental hazards and health disparities in California, a critical function of public health programs. CEHTP must continue to utilize statistical, technological, and participatory methods to support a variety of stakeholders in their efforts to reduce environmental and health disparities in communities.